



# “In the garden, I make up for what I can’t in the park”: Reconnecting retired adults with nature through cultural ecosystem services from urban gardens

Neven Tandarić<sup>\*</sup>, Charles Watkins, Christopher D. Ives

School of Geography, University of Nottingham, United Kingdom

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## ABSTRACT

While cultural ecosystem services (CES) provided by collective urban gardens have been researched for more than a decade, how knowledge of CES can inform the governance of gardens and enhance gardeners' wellbeing remains a challenge. Retired adults are a group whose lives can be especially improved by collective gardening. We interviewed users of community and allotment gardens in Zagreb to explore their motivations for gardening and the influence of different forms of garden management on the generation of CES. Their responses were supplemented and contextualised by interviews with urban planners, academics and gardening activists. We used Fish et al. (2016) framework to identify CES in interviews. As expected, CES drove gardeners' engagement. We grouped their motivations into six categories: escape, usefulness and tradition, home-grown produce, socialising, wellness, and private oasis. Interestingly, food production was only of secondary importance as a motivator of urban gardening. Findings are used to outline recommendations for urban planners and decision-makers regarding planning, design and management of collective gardens that would amplify the generation of CES for retired gardeners.

## 1. Introduction

Over the last two decades, the practice and research of collective urban gardening have proliferated in Europe. In addition to allotment gardens, usually provided by municipal authorities, there is a proliferation of other forms of collectively managed urban gardens arising from grassroots initiatives including community gardens (Dennis and James, 2017). In predominantly built-up urban areas, collective gardens are often green oases facilitating biodiversity and encounters with nature. But in contrast to most other types of urban green spaces where people are primarily consumers (e.g. parks and recreational grounds), collective gardens are also spaces of food production, place meanings and ambience (Atkinson, 2007). The benefits of collective gardens range from increased urban biodiversity, local climate regulation and storm-water infiltration (Guitart et al., 2012) to food security and contributions to gardeners' physical and mental health (Artmann et al., 2021). Social and environmental researchers increasingly assess these benefits using the ecosystem services concept that conceptualises how nature sustains and fulfils human life (Dennis and James, 2017).

Cultural ecosystem services (CES) entail ecosystems' contributions to human wellbeing that help enable the experiences, equip the

capabilities and frame the identities of people engaging with ecosystems in some way (Fish et al., 2016). One of the main advantages of CES stems from their comprehensibility by laypeople. Unlike most other ecosystem services (provisioning, regulation and maintenance), CES can be perceived directly and experienced locally, irrespective of people's ecological knowledge or the availability of measuring equipment (Andersson et al., 2015). For instance, gardeners might not be aware that gardens provide habitat for various plant and animal species (supporting services) or contribute to seed dispersal and pollination (regulating services) at the city level (Camps-Calvet et al., 2016), but they can directly perceive the therapeutic effect of spending time in the garden (Summers and Vivian, 2018) or a feeling of accomplishment when crops yield (Finlay et al., 2015). And indeed, research indicates that gardeners are aware of and value contributions that correspond to CES more than other ecosystem services (Borysiak and Mizgajski, 2016; Robert and Yengué, 2017; Slavuj Borčić et al., 2016).

In contemporary urban sustainability discourse, CES' quality to be perceived and valued directly by users can be seen as a vantage point in combating various urban problems and encouraging urban sustainability (Klepacki and Kujawska, 2018). Indeed, industrial and post-industrial ways of life have diminished urbanites' contact with

<sup>\*</sup> Correspondence to: School of Geography, University of Nottingham, Sir Clive Granger Building, University Park, Nottingham NG7 2RD, United Kingdom.

E-mail addresses: [neven.tandaric@nottingham.ac.uk](mailto:neven.tandaric@nottingham.ac.uk) (N. Tandarić), [charles.watkins@nottingham.ac.uk](mailto:charles.watkins@nottingham.ac.uk) (C. Watkins), [chris.ives@nottingham.ac.uk](mailto:chris.ives@nottingham.ac.uk) (C.D. Ives).

nature leading to increasing alienation from nature and less interest in its protection (Louv, 2008; Soga and Gaston, 2016). Researchers, policy-makers and stakeholders seek solutions to reverse this trend (Schuttler et al., 2018). It is well recognised that collective gardens can attract urban residents interested in more intense interaction with urban nature, which is crucial for fostering a meaningful connection with nature and care for its protection (Artmann et al., 2021; Lin et al., 2018).

Studies have shown that collective gardening is especially valuable for retired adults as it fulfils their free time, supports the family budget via gardening products, and greatly contributes to physical and psycho-social wellbeing (Finlay et al., 2015; Slavuj Borčić et al., 2016; van den Berg et al., 2010). Van den Berg et al. (2010) found that retired gardeners in the Netherlands experienced greater health and wellbeing benefits from gardening than their non-gardening neighbours of a similar age, and Slavuj Borčić et al. (2016) revealed that gardening could generate the feelings of usefulness that retired adults lost as well as community belonging. Considering the global trends of population ageing, the retired population will only increase over the following decades, especially in European countries (United Nations, 2019). If collective gardens can contribute to life satisfaction among older people and simultaneously contribute to reconnecting urban residents with nature, they have an important part to play as a public service provision alongside parks and recreation grounds.

Despite the proliferation of research on collective gardening (Bell et al., 2016), the generation of CES by collective urban gardens is still poorly explored (Cheng et al., 2021), and consideration of CES in the governance of gardens (especially planning) is virtually untackled (for exceptions see Camps-Calvet et al. (2016) and Langemeyer et al. (2018)). Further, we do not know enough about what motivates citizens to engage in collective gardening (Lee and Matarrita-Cascante, 2019) nor how such motivations relate to the CES provided by collective gardens. Consequently, urban planners and decision-makers do not have relevant information that would help them shape effective policies to increase the generation of CES in collective urban gardens to the scale of wider urban communities. This study explores retired gardeners' motivations for urban gardening and the cultural services and benefits they receive to advance knowledge that could enable scientists, planners, and practitioners to more effectively develop programmes and plans for collective urban gardens that meet the needs of retired adults.

The study is situated in Zagreb, Croatia, where collective gardening dates back to the 1970s. In order to address the diversity of collective garden forms, we compare practices of allotment and community gardening in Zagreb. The study is guided by the following research questions:

1. What motivates use of collective gardens among retired adults?
2. What is the relationship between use motivations and the CES derived from the gardens?
3. Do different management regimes in collective urban gardens influence the provision of CES, and if so how?

### 1.1. The CES framework

We use Fish et al. (2016) framework for assessing CES as it represents a useful model for comprehensively assessing CES while connecting to the existing well-recognised and widely used ecosystem services cascade model (Potschin-Young et al., 2018). The framework distinguishes different elements of the cascade—biophysical structures and processes in ecosystems that underpin cultural services, benefits and goods. Discerning different elements of the CES cascade is crucial in planning because not all elements are (equally) plannable, and some non-plannable elements may be valuable indicators for planning (Tandarić et al., 2020). Fish et al. (2016, p. 211) define CES as “relational processes and entities that people actively create and express through interactions with ecosystems”. They appear in ecosystems as

environmental spaces and cultural practices which enable and shape each other (Fig. 1). Environmental spaces are the spatial contexts in which human practices are performed. Practices may be performed as part of work, leisure, ritual, etc. and generate cultural alongside other ecosystem contributions. For instance, food produced in urban gardens is a provisioning contribution but may also be valued for its cultural dimensions such as connection with nature or accomplishment (cf. Urquhart and Acott, 2014). CES are thus often bundled with other ES, which reflects the plural values of human–ecosystem interactions (Kenter et al., 2019).

The interaction between environmental spaces and cultural practices may generate cultural ecosystem benefits (CEB), i.e. contributions to human wellbeing “in terms of the identities they help frame, the experiences they help enable and the capabilities they help equip” (Fish et al., 2016, p. 211). Human involvement is crucial in the generation of CEB as individuals engage in cultural practices according to personal preferences, desires, and needs. Their attitudes and emotional reactions to the interaction with an ecosystem mediate the generated CEB, which are therefore always personal (Tandarić et al., 2020). The human–ecosystem interactions may also produce exchangeable outputs (sometimes even in monetary terms) that can satisfy individuals’ needs and thereby change their wellbeing (Church et al., 2011). These are ecosystem goods and can range from tangible outputs (such as food or ornaments) to intangible ones (such as the exhibition of food from gardens). When those goods help generate cultural benefits (such as life satisfaction or cultural identity), they are characterised as cultural ecosystem goods (CEG).

### 1.2. Collective urban gardens in Zagreb

The collective gardens in Zagreb originated in the 1970s on neglected city-owned lands in newly constructed neighbourhoods. Residents cleared the land and laid out garden plots. Such gardens were illegal (and are referred to as *wild gardens* in Croatian literature), but the socialist authorities tolerated them due to the lack of funds for developing the occupied lands. Wild gardens represented a hybrid form of community gardens. They arose through grassroots initiatives on city-owned land, and gardeners jointly installed and shared water pumps (Gulin Zrnić and Rubić, 2019). However, their structure consisting of ‘private’

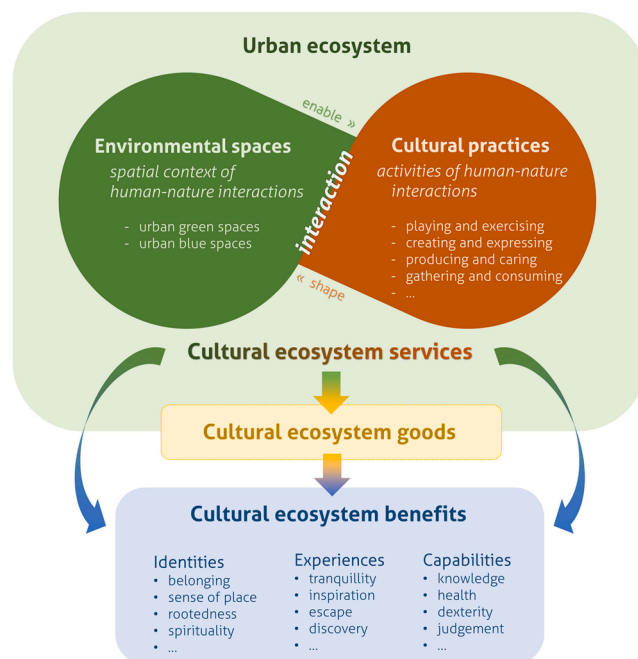


Fig. 1. CES research assessment framework, adapted from Fish et al. (2016).

plots and narrow public passages resembled that of allotment gardens, even though there was no authority that allotted the plots to gardeners. The plots are irregular in shape and size, and gardeners often constructed various simple structures there. Slavuj Borčić et al. (2016) found that rural incomers often created wild gardens during Zagreb's rapid socialist industrialisation, seeking links with an earlier rural way of life. Consequently, wild gardens are nowadays primarily maintained by pensioners.

Some wild gardens were removed in the post-socialist period due to private land development. One such event in 2012 attracted public interest, and a group of activists and intellectuals gathered in a civil initiative called Parktipicacija advocated the establishment of legal community gardens in Zagreb. The following year, the city administration initiated the City Gardens project, creating allotments and leasing them to interested citizens free of charge. The number of city garden areas increased from five in 2013 to thirteen in 2019. In contrast to tolerated but illegal wild gardens, the formally created city gardens have attracted a more heterogeneous population in terms of age, education and family origins (Slavuj Borčić et al., 2016). Despite the project's immediate success and growing interest in gardening afterwards, the city authorities have resisted formalising them as a planning category, which would affirm their long-term survival.

Whereas wild gardens still exist across Zagreb, they have not been legalised nor incorporated into the City Gardens project. The exception is wild gardens in Savica, which were supposed to be removed in 2013. After the gardeners' protest, the mayor decided to incorporate them into the City Gardens network and expand them with new garden plots. The old gardeners have retained the right to keep their plots in the 'wild' shape but had to follow the formal procedure of obtaining the right to use plots. The heterogeneous structure of gardeners is reflected in the spatial structure of garden plots (Fig. 2).

## 2. Materials and methods

### 2.1. Study area

Zagreb is the largest city and capital of Croatia. Its fast development is linked with socialist industrialisation (1945–1991), which attracted tens of thousands of rural incomers and induced rapid population growth (from 325,000 in 1948 to 707,000 in 1991). The undeveloped edges of new neighbourhoods often provided space for wild gardens. In 2019, the area of the city gardens network was 21.5 ha, whereas the area

and number of wild gardens are not known.

We collected data from three case study areas (Trnsko/Siget, Savica, and Jarun) selected based on their construction period. Trnsko and Siget are mid-socialist neighbourhoods constructed in the 1960s and 1970s. There are three areas of unplanned gardens in Trnsko, one in Siget, and one area on the border between the two neighbourhoods, which we approach as a single case study unit. Savica Neighbourhood was mainly built in the 1970s and 1980s, and there is one formalised area of gardens. Finally, Jarun Neighbourhood has been built since the 1980s, with new housing estates being added over subsequent decades. There are two areas of unplanned gardens. In each of the three case study units, one or two garden areas were chosen as venues for interviewing gardeners (Fig. 3).

### 2.2. Data collection

Semi-structured in-depth interviews were conducted with gardeners and other relevant stakeholders between July 2019 and January 2020. We approached fifteen gardeners, out of which ten agreed to participate in the research (positive response rate = 66.7 %), with more rejects by the 'wild' than the city gardeners approached. All interviewed gardeners were pensioners, with six female and four male gardeners. Among those, six were 'wild' and four were 'city' gardeners. It was difficult to interview more gardeners as few were present in urban gardens and some individuals were unwilling to participate. Many garden plots were not attended by gardeners during the days (in late August and early September) when the search for interviewees in gardens took place. In addition, due to their informal status (as documented previously by Biti and Blagačić Bergman (2014)), 'wild' gardeners were often suspicious of unknown visitors fearing the possible removal of their gardens and many refused to participate in interviews.

Because of the expected small sample of gardener participants and the differences in planning and management between wild and city gardens, we employed data source triangulation (Carter et al., 2014). Beside gardeners, we also interviewed urban planners and decision-makers (hereafter: planners), academics from various disciplines, and activists for the protection of parks and gardens from land-use changes. Their responses were used to supplement the discourse shaped by gardeners' responses. Activists participated in actions for the protection of gardens from land-use conversion and their legitimisation, and many were gardeners themselves. They provided additional insights into the differences between wild and city gardening and the motivation for the protection of spaces for gardening. Planners provided helpful information on the planning context to city gardens while academics gave scholarly interpretations of wild and city gardening practices.

Planners and academics were identified within relevant literature and planning documents based on professional interest in urban green spaces, whereas activists were identified through analysis of media resources, and selected because of their participation in actions and initiatives taking place in the case study areas or legalisation of collective urban gardens. Positive response to participate in interviews was gained by 38.5 % of invited planners, 40.0 % of invited academics and 69.2 % of invited activists. The final sample consisted of 10 gardeners, 10 planners (5 active in both periods and 5 only in the post-socialist period), 8 academics (urbanism, landscape architecture, sociology, geography, ethnology), and 9 activists.

Distinct interview protocols were developed for: a) gardeners, b) planners and academics, and c) activists (see Supplementary materials). The overarching topic was motivations for collective urban gardening, with subtopics referring to current motivations, drivers to begin gardening, and what gardening enables that other forms of spending free time cannot. While questions somewhat varied in different protocols due to different education, expertise and interests, they covered the same topics to maintain thematic consistency among participants. Interview protocols were structured and administered to enable extending the

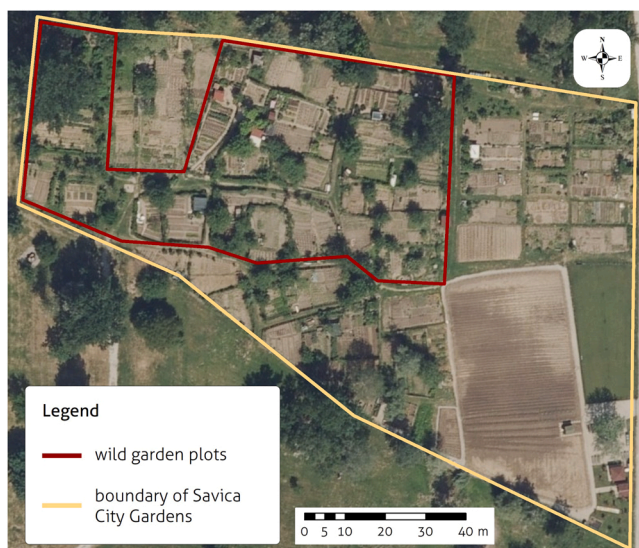


Fig. 2. The area of Savica City Gardens with an approximate boundary of incorporated wild plots.



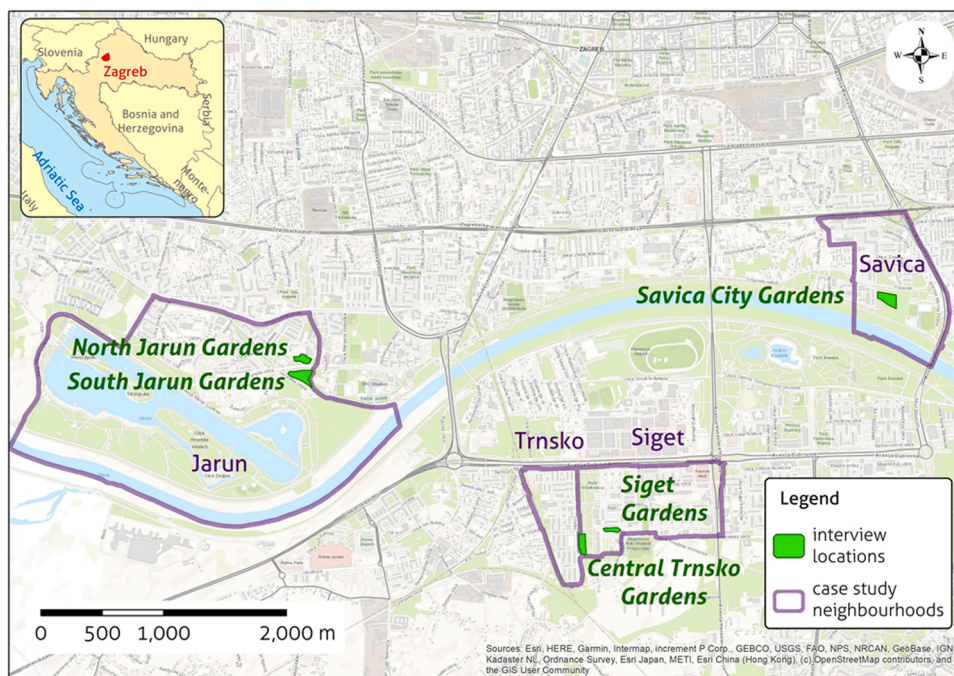


Fig. 3. Spatial distribution of case study areas and collective urban gardens in which interviews took place.

discussion on any question or topic which allowed the gathering of in-depth data matching respondents’ experiences and/or expertise. Interviews lasted between 15 and 172 min, primarily dependent on the cohort, talkativeness and available time for conversation. The mean length was 53 min.

### 2.3. Data processing and analysis

Interviews were audio-recorded and transcribed verbatim in Croatian. The analysis was carried out in Croatian to avoid loss of meanings and subtle indications that could not be unequivocally translated into English. Data were analysed in the software package NVivo 12 with material organised by questions and cohorts. The first stage entailed coding gardeners’ statements by motivations for gardening, distinguishing between engagement in wild and city gardens. Codes were then grouped thematically through the critical deliberation on data, yielding six motivation groups. Other participants’ statements were then coded by motivation groups to provide contextual data for evaluating, understanding and fine-shaping motivation groups. This allowed us to address the first research question.

In the second stage, the grouped gardeners’ statements were coded following Fish et al.’s (2016) framework to extract the underlying CES. Each statement was run through the analytical framework (depicted in Fig. 4), where comments related to gardeners’ interactions with nature were identified and coded by a corresponding element of the CES cascade. Afterwards, statements in each CES cascade element were coded to create categories (e.g., same or similar activities or contributions to wellbeing). This allowed addressing the second research question.

## 3. Results

This section presents the results of the data analysis. The first subsection outlines the motivation groups providing the evidence for research question 1. Where relevant, evidence was disambiguated for wild and city gardening. The second subsection presents the identified elements of the CES cascade, discriminated by ‘wild’ and city gardeners, providing evidence for research questions 2 and 3.

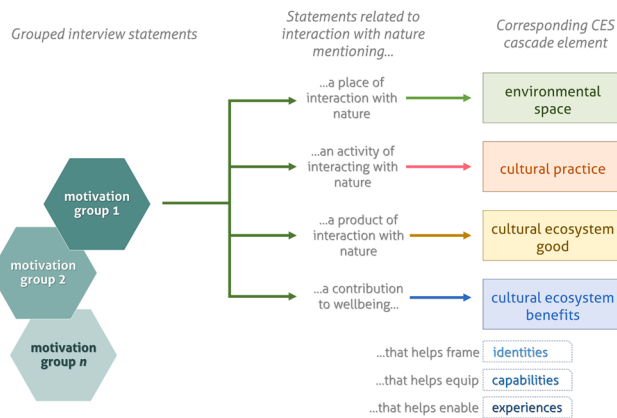


Fig. 4. Analytical framework for extracting CES from interview statements.

### 3.1. Motivations

Interviewed gardeners were keen to talk about various activities and contributions to their wellbeing that they generated in gardens. Analysing gardeners’ narratives, we outlined six groups of motivations for engagement in collective urban gardening (Fig. 5). The underlying motivation—*escape*—is the need to get out of the flat and built environment, where gardens allow diverse cultural practices and generate various CEB. Most gardeners stated this motivation along with one or more other motivations. Below we describe these motivations.

#### 3.1.1. Escape

When asked about the motivation for gardening, virtually all gardeners first expressed the need to get out of their flats. One gardener (64/F) from Trnsko/Siget depicted it as: “I enjoy that I don’t have much, but at least I can breathe here freely unlike in my small flat. You can’t wait to escape from those catacombs.” An interviewed academic geographer (38/F) recalled a response she got from one interviewed gardener to be: “When I’m home, my whole body hurts because I stiffen in front of the TV. But when I come to the garden, I can use the spade the whole day, and nothing



Fig. 5. Motivations for engagement in collective urban gardening.

hurts.” However, for some gardeners, it is not only an escape from flats but from a conventional social environment as well. A gardener (71/F) from Trnsko/Siget thought, “I would be within my four walls, peering through the window to see who wears what kind of trousers or shoes” only to afterwards “go for coffee and gossip with others”. She continued: “Here I don’t care about anyone and no one cares about me and that feels great”.

Although socialist neighbourhoods were designed in Corbusian style with plenty of greenspace surrounding buildings, they still recall the urban environment. One gardener (69/M) from Savica described it as “I’m saturated with concrete. When you come here, it’s five degrees cooler than in front of the building.” For many gardeners, gardens almost entirely replaced parks for interaction with urban nature and they only cross them on their way to the gardens. A gardener (55/M) from Savica depicted that by saying: “I frequent the garden and enjoy myself here. I’m 55; what would I do in the park?”.

The sentiments expressed by gardeners were somewhat echoed by interviewed professionals. One planner (53/F) thought that for many people, “Gardens are an upgrade to the service of parks” because they enable comparatively more activities and benefits and they can galvanise the sense of local community. An academic geographer (38/F) deliberated that “in the park you go running—young people I mean—they will run, roll skate, cycle. But older people won’t. That’s why the recreation provided by gardens is important to them. Besides, gardens provide other benefits as well. When you run, you usually run alone, or cycle, but when you garden, different kinds of interaction develop among gardeners.” One gardening activist (45/F) supposed that “maybe in the garden, I make up for what I can’t do in the park. I can’t plunge my hands into the soil, I can’t plant and sow something.” The interaction with nature is indeed strikingly dissimilar in parks and gardens.

### 3.1.2. Usefulness and tradition

Gardeners in Zagreb are predominantly pensioners left with plenty of free time, which gardening filled. Many of them reported that in gardens they feel useful again. After retiring, a gardener (71/F) from Trnsko/Siget found an occupation in the garden because “I enjoy working!” She added that “I can’t imagine, say, lying at home right now.” Similarly, a gardener (55/M) from Savica thought “you do some digging, make yourself useful” because “there’s nothing for you to do in the flat.” The majority of interviewed gardeners were either incomers from rural areas or had firm connections with their rural families. A gardener (69/M) from Savica described how his origin shaped his need to be useful: “I’m a rural child, and since I’ve known for myself, I was helping my mum and my grandma in the garden. I was never idle.” Gardeners in Zagreb “have deep roots and connections with their rural origin”, according to an academic sociologist (73/F) who thought: “They just aren’t the people who would go to the market and buy a kilo of tomatoes; it’s nicer for them to grow tomatoes themselves.”

Reminding them of rural tradition, gardens also help generate a sense of place attachment and dependence. One gardener (64/F) from

Trnsko/Siget said that “if they take it from us, they will take half of our lives.” Another gardener (72/F) from Trnsko/Siget testified a spiritual effect she received in her garden: “The very contact with earth drains negative energy.” Whereas gardeners’ responses only hinted at the links between rural tradition and greater connectedness with nature compared to urban lifestyle, planners, academics, and activists often referred to the human need for contact with nature. One activist (45/F) who actively gardens thought that in the past “people were much more connected with nature and they actually lived surrounded by nature. So something draws us to nature—be that a garden or some other place. I think we are innate to be more surrounded with nature than the urban way of life enables.”

### 3.1.3. Home-grown produce

Produce seems like an obvious provisioning service from gardens, but gardeners rarely referred to nutritional or financial dimensions of gardening. One gardener (70/M) from Jarun stated that “for the whole summer I don’t go to the market. We don’t buy food because we have everything here.” However, another gardener (60 +/F) from Jarun demonstrated why financial relief is an improbable motivation: “a kilo of our vegetables doesn’t cost 20 kunas, that’s cheap, it’s worth 300 kunas when you consider how much work we put in it”.<sup>1</sup> Moreover, a gardener (69/F) from Savica assessed that “there are very few who garden because of the need”. The real reason outlined by several gardeners was the benefit of pleasure for not depending on the food market and knowing the origin of the food. A gardener (64/F) from Trnsko/Siget illustrated it well: “I love everything home-grown and home-made. I dry the herbs because then I know what I use, what I consume.” She went on proudly: “Here’s a cherry tree, I make cherry brandy for my husband, I make jams, all of that, and I like a cherry compote. And I know it’s mine—I enjoy that.”

Indeed, gardeners’ responses tend to emphasise the cultural benefits (including the sense of accomplishment) of growing their own food over the functional ones. A gardener (69/M) from Savica said, “Well, you get some satisfaction when... you see, two months ago there was nothing there, and now there are tomatoes, there are peppers...” (Fig. 6). He rejoiced: “And you take it home, and children and grandchildren say it’s better than those from the grocery store. The little one says: ‘That’s the real tomato!’” His garden-neighbour (70/F) concurred: “I can’t remember the last time I bought tomatoes. Lettuce also never. Once you know the difference in taste... you never [want to eat bought ones again]”. One planner (71/M) attested that “When you talk to gardeners, they’re so proud of their tomatoes, just as if



Fig. 6. A gardener’s (69/M/Savica) gift of tomato, peppers, sage and rosemary to the interviewer (taken on 24/08/2019 by the author).

<sup>1</sup> In 2019, 20 kunas equalled ca. €2.70; 300 kunas equalled ca. €40.00.



they were the best in the world.” However, wild and city gardens do not facilitate the generation of such CEB to the same degree. While fruit trees and bushes are frequent in wild gardens, they are not permitted in city gardens because they are allocated on a two-year basis. Gardeners from Savica, therefore, talked exclusively about vegetables.

### 3.1.4. Socialising

Socialising was a major motivation for engaging in collective gardening. Gardeners from wild gardens said that they had gardened “mostly because of company we have here” (60 +/F/Jarun) or “more for fun and socialising than for gain” (72/F/Trnsko/Siget). An activist (55/M) who gardened corroborated: “My main motivations were gathering and hanging around in the garden, plus I have a horticultural interest. So to me, it’s not that important whether there are tomatoes, peppers, whether they are produced organically or not. I want that people feel good in the garden and want to hang around.” Most wild gardens were complemented over time with various shade structures. A gardener (70/M) from Jarun said proudly: “We built a gazebo where we have a table and chairs, we also have a barbecue.” He asked: “Why would we sit in the flat? We come here, invite neighbours, and we hang out, eat and have fun.”

Indeed, socialising was regularly linked with consuming food in a company. A gardener (64/F) from Trnsko/Siget shared that “I love to treat my good neighbours. We like to treat ourselves to barbecue and coffee...” Gardeners often installed barbecues in their wild gardens, whereas in the city gardens there is the common space “equipped with barbecues where fellow citizens hang around” (54/M/planner). However, none of the gardeners from Savica referred to using the common space. Moreover, gardeners’ responses suggested that wild gardens facilitated meeting other gardeners much better than the city gardens. A gardener (70/F) who created her garden plot before all the plots were incorporated into Savica City Gardens emphasised: “We old gardeners all know each other.” while another (69/M) said that new gardeners “stick more to themselves”. One activist (45/F) who gardened in the wild garden interpreted that “clearing and dividing the land and launching the gardens—that brought us closer.” She continued that new gardeners “did not have the experience of launching the gardens, and they did not consider the gardening community as something important; they just came gardening.”

Another socialising activity reported among ‘wild’ gardeners was exchanging knowledge, ideas and skills. A gardener (72/F) from Trnsko/Siget described how “If something succeeds in someone’s garden, others would come and ask ‘How it worked for you? It didn’t for me’ and so on.” Then they would share what they did and learned with interested gardeners. Learning through gardening was usually mentioned in socialising rather than solitary contexts. Some gardeners mentioned teaching their children or grandchildren gardening and ecology-related knowledge. A gardener (70/F) from Savica City Gardens gave an example of her grandson who, by helping her in the garden, learned “every plant, their names, what’s poisonous, what’s not poisonous, edible or inedible.” Her garden-neighbour (69/F) thought that school children could be engaged in gardening and learn about nature first-hand.

### 3.1.5. Wellness

Various kinds of health benefits motivated gardeners to start gardening. One gardener (69/M) from Savica said that “principally retirement encouraged me to start gardening. Look, health problems come primarily from sitting and inactivity.” The therapeutic effects of gardening range from better somatic health due to physical activities to psychological benefits, which one gardener (60+/F) from Jarun well depicted saying “It’s psychophysical relaxation. A person physically recreates, and that mentally calms them down.” Whereas these effects were important for pensioners, war veterans who gardened in Savica City Gardens also leaned on them. One of them (55/M) said: “I come here, rest my nerves for some time, then I barbecue some meat, call friends...”

Several gardeners stressed that growing healthy vegetables is important to them. A gardener (64/F) from Trnsko/Siget stressed that she produced “organic food. I’m cautious: I spray tomatoes only with diluted

milk.” An academic geographer (38/F) explained that “they want it to be natural, to be sure that they eat healthy food.” A gardener (70/F) from Savica said proudly that “Our gardens are BIO. We don’t poison plants with anything. We sprinkle them with nettle, comfrey, horsetail... We pick up the snails rather than using limacides which are among the deadliest poisons.” Her garden-neighbour (69/F) followed: “I pick a cucumber every day, wipe it and eat it with the skin. I’m not afraid because I know it wasn’t sprayed with chemicals.” A gardener (66/F) from Jarun complained, however, that some gardeners “still spray plants” and then “wind drifts the droplets to our gardens”. Some academics warned about the locations of some gardens along roads, making them susceptible to traffic pollution. However, gardeners did not seem to worry much. One gardener (69/F) from Savica explained that they “have those green barriers which somewhat protect gardens.”

### 3.1.6. Private oasis

In the search for respondents, the interviewer entered dozens of garden plots, each with its unique character. Rather than merely the farming units, wild and formalised garden plots were personalised, multifunctional private spaces, as a gardener (69/F) from Savica noted: “organised so that we can come, relax... When not gardening, we can lay down on a deck chair, read and relax.” She concluded: “this is our tranquillity oasis.” On top of valuing individual benefits that gardens and gardening provide them with, gardeners also value the comprehensive character of plots that has originated through the continuous interaction between gardeners and place. They organise their activities in gardens to utilise the garden character they created. A gardener (71/F) from Trnsko/Siget described her afternoon: “I’m here to do some gardening chores and to make myself an atmosphere for the evening. Between say 5 and 7 o’clock, I will sit down here, drink a coffee and enjoy the flowers.” According to one gardening activist (45/F), that is the decisive advantage of gardens over parks: “I can shape my garden the way I want whereas I get the park the way someone else designed it.”

The interaction between gardeners and their gardens does not result only in the unique ambiances of such ‘private oases’, but also in benefits such as strong place attachment. A gardener (64/F) from Trnsko/Siget attested: “When someone says: ‘Why do you need that?’... Why, it’s beautiful when everything is neat, and you come here, sit down, and watch it growing... That means everything to me.” Another gardener (69/F) from Savica emphasised that her garden allows her to “get out of the house, to do something, to be physically active... it’s a delight above all to have such place completely for yourself!”

The feelings of privacy and possession of such space are inherent features of wild gardens where individual plots are enclosed with high, screening fences (usually hedgerows), and those who own the plots can plant trees and shrubs. In the city gardens, however, plots are separated by paths and wire fences (Fig. 7). Furthermore, planting trees and shrubs as well as building structures and barbecues is prohibited in city gardens because, as one planner (53/F) stressed, “gardeners sign a two-year contract for leasing plots after which they have to re-apply.” She continued: “Sometimes they do it self-willed, but it looks terrible and then we ask them to remove it.” The old gardeners in Savica City Gardens successfully fought to preserve plots as they were before formalisation, but the new gardeners cannot enjoy the same level of privacy.

## 3.2. Organising gardeners’ motivations using the CES framework

Interview statements were processed through Fish et al.’s (2016) CES framework to translate gardeners’ motivations into cultural services, benefits and goods. We identified four different environmental spaces, ten cultural practices, twenty CEB and at least two CEG (Fig. 8). How respondents talked about gardens (environmental spaces) and gardening (cultural practices) emphasised their relational character. Garden plots were referred to as “pleasant place”, “tranquillity oasis” or “place completely for yourself”, implying the personal relatedness with it as well as contributions to one’s feelings and wellbeing. Cultural practices

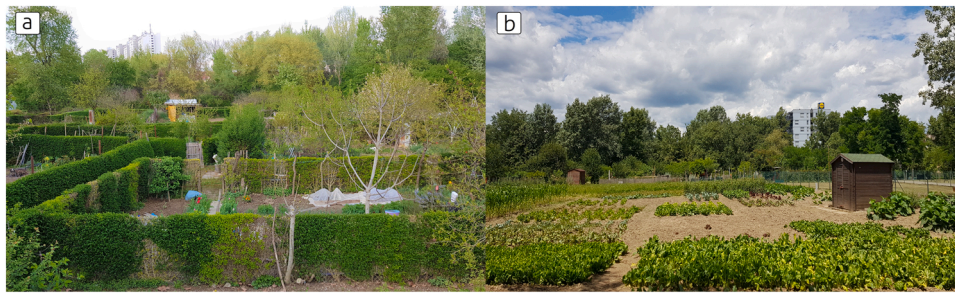


Fig. 7. Garden plots in a) wild gardens in Jarun and b) Savica City Gardens (taken in July 2019 by the author).

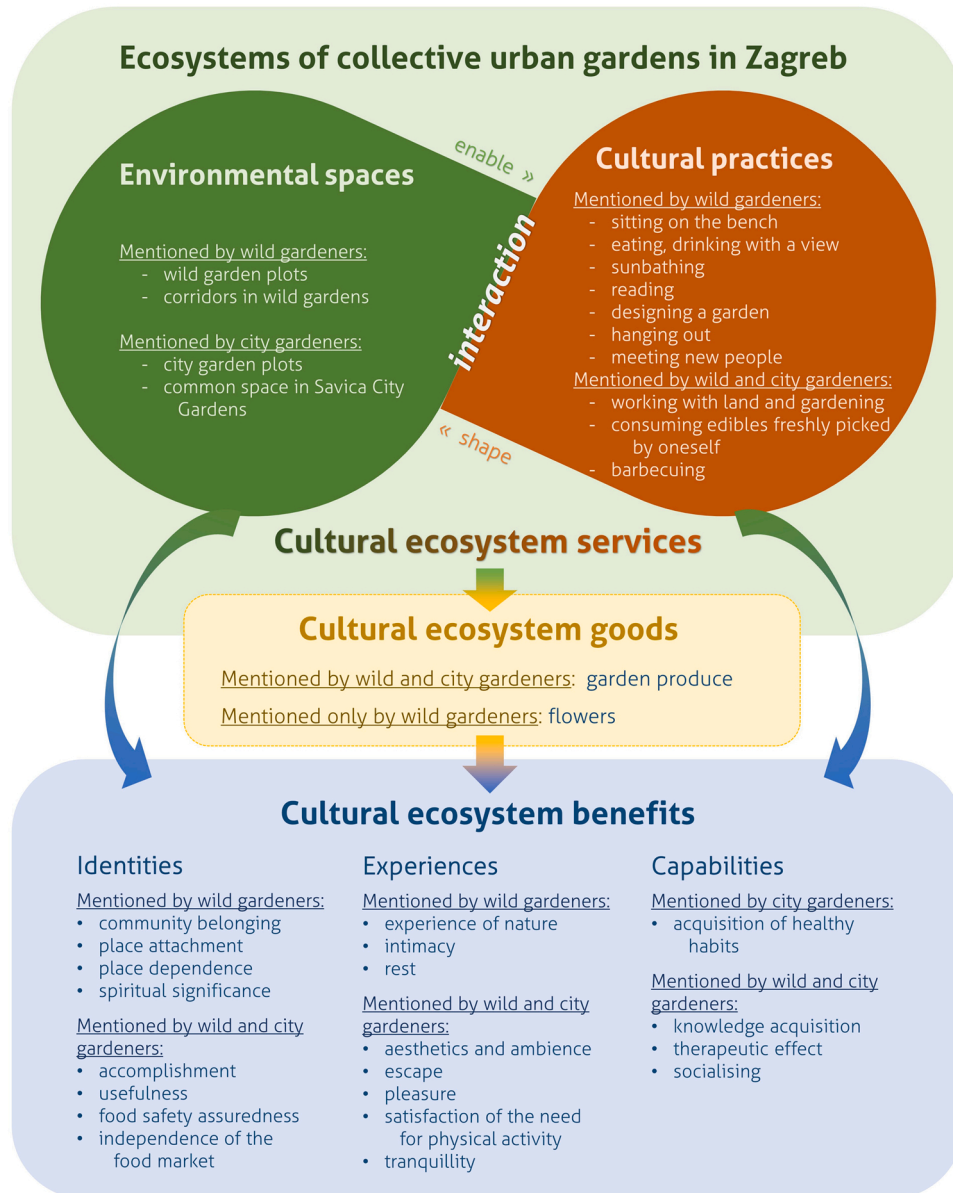


Fig. 8. Identified CES using Fish et al.'s (2016) framework.

were mentioned in a similar way: “I dry the herbs because then I know what I use” or “A person physically recreates, and that mentally calms them down.” In these examples, gardeners value the very practices and spaces for the contributions they generate for them, and thus they maintain those spaces and perform practices.

Both environmental spaces and cultural practices were often coupled

in statements with one or more CEB. Such interweaving suggests that gardeners have learned which CEB will be generated from coupling a particular practice and an environmental space. Moreover, gardeners reportedly shaped their related gardening practices to ensure the generation of *food safety assuredness* and organised/equipped their plots to facilitate *relaxation*, *intimacy* and benefits of socialising. Finally,

gardeners reported flowers and produce, which correspond to provisioning ecosystem goods. However, the contexts in which those goods were mentioned reveal their cultural dimension—they were produced not for their nutritional and financial but cultural contributions to wellbeing, including the sense of *accomplishment* and *independence of the food market*. The interview statements suggest that CEG symbolise gardeners' effort, achievement in terms of growing a flower or vegetable from the seeds, and a certain independence from the grocery shops.

Fig. 8 depicts which elements of the CES cascade were identified from 'wild' and city gardeners. Noticeably more elements were identified in the interview statements by 'wild' than city gardeners. The difference is most visible in the case of cultural practices, where city gardeners mentioned only a few practices. City gardeners again mentioned markedly fewer CEB, and there was only one CEB that city gardeners reported receiving, and 'wild' gardeners did not (*acquisition of healthy habits*). In addition, *garden produce* (CEG) entailed a more varied range of produce in the case of 'wild' gardeners (vegetables, herbs, fruits) than mentioned by city gardeners (only vegetables).

#### 4. Discussion

Here we discuss the multiple motivations for collective urban gardening reported by gardeners, followed by reviewing the suitability of Fish et al.'s (2016) framework to capture the elements of the CES cascade from reported motivations. We make recommendations for urban planners and decision-makers focused on creating and managing collective urban gardens and end the discussion with some methodological remarks.

##### 4.1. Multiple motivations for collective gardening

We identified six groups of motivations for collective gardening. Their common features are: (1) they are not mutually exclusive, and (2) they all pertain to cultural contributions to gardeners' wellbeing. Each gardener reported motivating practices and benefits from at least two motivation groups, whereas some reported practices and CEB from all six groups. Interestingly, gardeners rarely talked about classical gardening activities such as digging or planting, and when they did, it was usually to provide a context for generated benefits. In the same manner, produce and flowers were rarely mentioned for their financial and nutritional contributions, but more often for the CEB they generated, corresponding with an earlier study by Slavuj Borčić et al. (2016). This contrasts findings from some other post-socialist countries, such as Bulgaria and Romania, where collective gardening represents a survivalist strategy of the poorest urban dwellers (Alber and Kohler, 2008). The significance of cultural over provisioning contributions of gardens seems to date back to the socialist period when collective gardening in Zagreb originated as a continuation of the tradition and learned way of life rather than the need for nutrition (Slavuj Borčić et al., 2016).

The outlined motivations generally correspond with those found in other studies conducted in western cities: reconnection with rural tradition and nature (Armstrong, 2000; Langemeyer et al., 2018; Sonti and Svendsen, 2018), home-grown produce (Ruggeri et al., 2016; Scheromm, 2015; Sonti and Svendsen, 2018), wellness (Armstrong, 2000; Glavan et al., 2018; Ruggeri et al., 2016; Sonti and Svendsen, 2018) and socialising (Glavan et al., 2018; Sonti and Svendsen, 2018). We also found escape and private oasis to be major motivations, despite these themes having received less attention in the literature. An exception is Hanson et al. (2021), who found that some gardeners in Lund, Sweden, experience family gardens as "private retreat" places, whereas escape was found as motivation for visiting parks to escape from flats and stressful environments (Brown et al., 2018; Chiesura, 2004). We can speculate that many gardeners in Zagreb would resort to parks if there were no collective gardens. Gardeners' responses illustrated that gardens represent an alternative to parks for many of them by facilitating different kinds of physical activities than parks and providing different

opportunities for contact with nature.

##### 4.2. Suitability of CES framework

Fish et al.'s (2016) CES framework successfully captured the different elements of the CES cascade—services (environmental spaces, cultural practices), benefits and goods—from motivations for gardening reported in interview transcripts. Whereas environmental spaces and cultural practices have physical reflection and could therefore be more easily comprehended and captured by the framework, the same is not valid for CEB. While categorising the reported CEB was attempted, their relational evolution made them subtly multifaceted and consequently more diverse than the vocabulary could capture. This pertains both to the limitations of everyday language among gardeners and the vocabulary of the CES framework. For instance, most respondents talked about socialising through cultural practices, but from their statements' broader contexts, we could glimpse which benefits were generated from those practices. Moreover, implied benefits of socialising could be read through *community belonging* (contribution to identity), *knowledge acquisition* (contribution to capabilities), *feeling less lonely* (temporary experience but may also be a contribution to identity if a person is friendless), and for some gardeners through more than one of those CEB (cf. Fish et al., 2016).

The demonstrated awareness of CEB generated in collective gardens and reported CEB such as *escape*, *experience of nature*, *place attachment*, *spiritual significance* and *food safety assuredness* indicate that gardening likely leads to increased affinity for nature and pro-environmental behaviour that researchers call for as the means of combating urban alienation from nature (Ives et al., 2018; Soga and Gaston, 2016). Even if gardeners are not aware of the strictly ecological contributions of gardens, such as air purification or habitat provision, they care for gardens because of CEB, which they can perceive and receive (Andersson et al., 2015). The provision of gardening opportunities should therefore be encouraged by planners as one of the pathways towards urban sustainability.

The context in which flowers and gardening produce (identified as CEG) were mentioned suggests that those can at the same time have nutritional and/or financial importance and cultural meaning, which was often emphasised over the former. CEG can materialise the relational value of human/gardener–ecosystem/garden interactions, symbolising the values of both invested into and received from the interaction. Moreover, the materialisation of the relational value implies a certain continuance. For instance, CEG, such as ripened tomatoes, may help generate a sense of *accomplishment* (i.e. CEB) in the ripening season, but they can also serve as emblems of human–nature interactions and help re-generate that CEB at a later time. In addition, tomato chutney made out of those tomatoes can invoke the sense of *accomplishment* and *independence of the food market* in the winter, even far from the garden.

Hence, gardening CEG are valued as both gardening products and carriers of benefits. However, the CEB-carrying property is mainly linked with its producer, and it dissipates or may even disappear when the CEG is transferred to another person. For instance, a person receiving a tomato may value it for being produced organically but may not receive the benefit of *accomplishment*. CEG are rarely mentioned in the literature (e.g. Church et al., 2011) and represent an area for further research. The literature on the cultural, social, psychological and physical health benefits derived from home food production might provide valuable input into understanding CEG.

##### 4.3. Recommendations for urban planners and decision-makers

Humans have a strong affinity towards nature and seek contact with it (Wilson, 1993). In that context, the built and social environments of contemporary cities may seem overwhelmingly unnatural and stressful. While urban parks and forests may be obvious retreat choices, some citizens of Zagreb (but also Lund, Sweden, according to Hanson et al.



(2021)) preferred gardens. Given that no single solution will work for everyone, providing diverse opportunities for interaction with nature in cities should better target urban populations' diverse preferences and needs (cf. Tandarić et al., 2020). Collective urban gardens represent an excellent option in such an endeavour. However, for collective gardens to provide a functional alternative for human–nature interactions to conventional parks, planners should emphasise their contributions to human wellbeing.

The longterm survival and popularity of wild gardens and steadfast demand for city garden plots indicate a strong interest in collective gardening in Zagreb, and an increasing number of gardening studies suggests that this is true globally. Respondents in this study demonstrated a preference for gardens over parks precisely because they facilitate different kinds of engagement with nature. Therefore, there is an opportunity for planners to use the interest for the collective urban gardens to foster reconnection of urban population with nature and advance efforts to achieve urban sustainability. Our analysis identified certain disparities between Zagreb's forms of community (wild) and allotment (city) gardens that affect the generation of CEB. Whereas each form has its distinct history and users, the planning and design-relevant features of a hypothetical hybrid of these two forms is discussed below. Policy recommendations are presented in three areas: promotion (how CES can be used to promote collective gardening and attract retired adults to use collective gardens), design (what collective garden design solutions can enhance the generation of CEB and contribute to the wellbeing of retired adults), and management (how CES can facilitate and advance the management of collective gardens).

In outlining the policy recommendations, we followed the premise that CES emerge from an interplay between people and places (Raymond et al., 2017). In practice—and this was supported by the comparison between wild and city gardens in Zagreb—this means that providing green spaces such as urban gardens may not be enough to encourage meaningful and lasting human–nature interactions nor elicit the generation of CEB. Indeed, the provided spaces should support diverse practices. Hence, the recommendations below aim to direct decision-makers towards better facilitating the interplay between people and places.

#### 4.3.1. Promotion-related recommendations

Retirement often brings a fundamental lifestyle change and unlocks much free time to be filled with new activities. The therapeutic effect of gardening and acquisition of healthy habits such as regular physical activity, daily breaks from stressors, or eating more seasonal fruits and vegetables may attract retired people to engage in collective gardening (van den Berg et al., 2010). In more general terms, the therapeutic effect of gardening can contribute to public health in cities, thus decreasing personal and public financial expenses for healthcare (Young et al., 2020). Additionally, an example of war veterans suffering from PTSD using gardening as therapy outlines it as a low-cost alternative to conventional medical treatments (Anderson, 2011). So-called “green prescriptions” are increasingly studied and suggested as a means to support mental health (Van den Berg, 2017).

Furthermore, with pensions often smaller than salaries, retired people have fewer financial opportunities for many urban activities. The sense of usefulness provided by collective gardening can hence be a significant pull factor, while its output can also contribute to retired households' budgets. Finally, the opportunities for socialising may be a decisive factor in attracting retirees to urban gardens. As the modern lifestyle breaks the connection with nature, it also breaks neighbourly connections, and after retirement, people often suffer from loneliness (Beridze et al., 2020). Opportunities for socialising and meeting new people reported by gardeners in Zagreb attest to the social role of collective gardens for retired adults.

#### 4.3.2. Design-related recommendations

The structure of city gardens clearly promoted food production over

other activities, despite the finding that ensuring nutrition and financial relief was only ancillary to cultural contributions of gardening. Acknowledging that this might not be the case in many cities (Alber and Kohler, 2008; Scheromm, 2015), collective gardens should integrate food production with opportunities for diverse social activities and interactions with nature that would enable the generation of valuable CEB. Considering that interviewed gardeners cherished opportunities for home-grown produce, privacy and socialising, it was evident from this study that trees, shrubs and hedgerows in wild gardens facilitated those opportunities. Fruit trees and bushes in collective gardens could expand the range of produce and CEB generated while nurturing, picking, processing and consuming fruits.

Even if garden plots are allotted for a fixed period without certainty that the contract will be renewed, the offered plots could vary in terms of containing perennials, and applicants could choose between plots with and without fruit trees and shrubs. A rather short (two-year) contract for leasing plots evidently prevents appropriation and personalisation of the garden, which is indispensable for performing certain cultural practices and generating a number of valuable CEB. We recommend that whenever possible, leasing contracts should have unlimited duration (as long as the plot is well looked after) or at least last for five or ten years.

The testimonies suggest that trees with shade-providing canopies within or in-between garden plots greatly increase both socialising and other beneficial activities such as sitting in the shade, resting or reading. Indeed, gardens are an excellent arena for meeting other retired gardeners and developing friendships, which Kingsley et al. (2020) found would not have evolved outside of gardens. Socialising in the garden under the tree may represent an alternative to retired adults' loneliness in flats or parks (van den Berg et al., 2010). Relatedly, simple structures such as gazebos and barbecues were repeatedly linked with socialising and pleasure in interviews. Their inclusion in garden plots might greatly increase the generation of benefits of socialising. Indeed, trees, shrubs, gazebos and barbecues transformed wild garden plots from merely farming units to multifunctional spaces that gardeners chose over flats and parks when it came to free time.

The study illuminated the role of hedgerows between garden plots, which facilitated more intimate socialising but also various solitary practices that generate a sense of escape, relaxation from stress, and tranquillity (Gulin Zrnić and Rubić, 2019). Hedged wild garden plots better accommodated the gardeners' need for expression than city garden plots whose soft boundaries (paths and transparent wire fence) do not provide privacy and intimacy. ‘Wild’ gardeners appreciated the opportunity to adjust the plot to create a particular ambience for preferred practices and CEB, which is aligned with the relational character of CES generating personal CEB (Fish et al., 2016; Tandarić et al., 2020). Such intense interactions with nature create strong bonds between gardeners and their plots, which are recognised as place attachment and place dependence (Brown and Raymond, 2007).

Louv (2008) emphasised that place attachment and dependence are among essential means for creating and facilitating connection with nature and care for its protection. From that point, offering both plots with hard (e.g. hedgerows) and soft (e.g. paths, transparent wire fences) boundaries might diversify the plot selection and the generation of CEB. Moreover, if monitored, such a division may provide valuable comparative insights for planners and decision-makers regarding the generation of CEB and demand for certain types of plots in local conditions. Not less important, natural elements in urban gardens would also provide other ecosystem services such as local climate regulation, air filtration and provision of habitat for urban wildlife (Cabral et al., 2017), even if those are not widely recognised by gardeners (Andersson et al., 2015).

#### 4.3.3. Management-related recommendations

While food production did not decisively motivate collective gardeners in Zagreb, they expressed aspirations and desires for organic farming that ensures independence from the food market and safe food. Garden planners and managers should adopt the organic farming policy

as well as ensure that gardens are protected from other urban sources of pollution such as traffic and industrial gases that may impair food safety (cf. Brown and Jameton, 2000). Thick and tall hedgerows encircling wild gardens in Zagreb might provide natural protection while delivering multiple other ecological and socio-cultural benefits (Montgomery et al., 2020).

Gardeners pointed out a significant and often untapped potential for formal and informal environmental education. When retired adults engage in gardening, they might need introductory training or peer-mentoring to start farming. Within the City Gardens project, workshops and training for gardeners are organised, and a gardening manual is made available for them (Mrakužić, 2018). Such an approach could help beginners in gardening and adapting to collective activities and already participating gardeners to advance their knowledge and skills. The successful fitting into the collective gardens, interaction with the soil and plants, and implementation of environment-friendly practices should strengthen the connection with nature and its considerate use (Scheromm, 2015; Teuber et al., 2019).

Collective gardens may also provide learning opportunities for children. Some gardeners in our study illustrated how children engaged in gardening may acquire valuable knowledge about nature. One gardening activist (45/F) well described the learning benefits for children: “When they come to the garden, they can watch the whole process—when they plant something and then watch it grow, they react with ‘Wow, I grew lettuce myself!’ It’s important to transfer such knowledge to children” so that “they don’t think everything can be bought in a store. Food doesn’t grow in stores.” Indeed, if gardens are used to provide children with a place to play or teach them about food production, this might counteract the extinction of experience and lead to a new generation of urban citizens interested in natural processes (Louv, 2008; Teuber et al., 2019). Moreover, such activities may lead to inter-generational connections to place. Hence learning opportunities should be considered when planning collective gardens.

The distinctive way gardeners care for gardens is shaped by the character and intensity of interaction with nature in gardens and the generated CEB. Wild gardens’ longterm success in Zagreb indicates that gardeners are enthusiastic stewards, responsibly using, managing and caring for gardens through sustainable practices. This suggests that the environmental stewardship concept could be incorporated into the management of collective urban gardens (Langemeyer et al., 2018). On the other hand, gardeners’ comprehensibility of CES can serve as a form of real-time ‘monitoring’ of the state and health of the ecosystem as gardeners would quickly register if the generation of usual CEB changes or disappears (Andersson et al., 2015). The joint stewardship of gardens could also strengthen the sense of social cohesion and community belonging, which weaken in modern cities (Slavuj Borčić et al., 2016).

#### 4.4. Methodological remarks and limitations

Although we interviewed a relatively small number of gardeners the detailed nature of the interviews provided rich qualitative evidence. We supplemented these interviews with evidence provided by other relevant stakeholders. The responses from planners, academics and activists’ were used only to understand and explain the motivation groups, not to identify them. The overlapping of a fair number of motivations found in this paper and other gardening studies supports the validity of the findings. Supplementing gardeners’ responses with responses by planners, academics and activists proved beneficial for understanding the differences between wild and city gardens and spatial and legal frames that direct and restrict the use of different types of collective gardens. Nevertheless, a larger sample would have enhanced the validation of the findings.

## 5. Conclusions

Collective urban gardens are a distinct type of urban green space that

require different forms and intensity of engagement from traditional parks. Yet, they also offer opportunities for the generation of different sets of cultural benefits. By supplying various CEB, including the sense of usefulness in return for direct contact with urban nature, collective gardens help to provide fulfilment for retired adults and reconnect them with nature. This study explored the motivations for gardening among retired adults in Zagreb to contribute to shaping effective plans and policies for collective urban gardening and better generation and utilisation of contributions to gardeners’ wellbeing. Six motivations were identified: escape, usefulness and tradition, home-grown produce, socialising, wellness and private oasis. Food production was overshadowed by multiple other socio-cultural practices and benefits, suggesting that motivations for and benefits of the practice of gardening are highly significant and need to be front and centre in any planning and management activity (not just the spaces and behaviours of gardening).

Fish et al.’s (2016) CES framework proved suitable and helpful in capturing motivations for collective gardening, outlining diverse elements of the CES cascade. It captured the relational character of cultural practices for which gardeners valued them as well as a variety of cultural benefits and goods that improve their wellbeing. However, it also indicated complexities and relationalities that do not always fit neatly into the framework structure. The performance of cultural practices and the generation of benefits was considerably influenced by the different management regimes of wild and city gardens. The spatial structure and composition of wild gardens (including trees, hedgerows, and simple built structures) facilitated different and diverse cultural practices and resulting benefits that city gardens could not provide. On the other hand, the city gardens provided better learning opportunities and ensured food safety. Following the revealed motivations and different effects of the two management regimes on the provision of CES, we made recommendations for urban planners and decision-makers in terms of promotion of collective gardening among retired adults, garden design and management for amplifying the diversity of cultural practices and benefits and better inclusion of gardeners through the environmental stewardship. These recommendations should contribute to building urban resilience in socio-economic and ecological terms (Langemeyer et al., 2018), reconnecting people with nature, and helping to achieve urban sustainability.

We emphasise that no recommendation is universally applicable as the local specificities of each city and each local community may dictate the suitability of particular solutions. Furthermore, our recommendations are generalised for a hybrid of allotment and community gardens that would amplify cultural services and benefits. Since there are thousands of existing allotment and community gardens worldwide, some recommendations may be applied to them only partially or with certain adjustments. While this study targeted retired adults, further research focused on other age/employment cohorts should improve the recommendations and encourage the broader urban population to garden and experience CEB more directly and possibly participate in environmental management (Teuber et al., 2019).

#### CRediT authorship contribution statement

**Neven Tandarić:** Conceptualization, Methodology, Investigation, Resources, Data curation, Writing – original draft, Visualization, Funding acquisition. **Christopher D. Ives:** Conceptualization, Writing – review & editing. **Charles Watkins:** Conceptualization, Writing – review & editing.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data Availability

Data will be made available on request.

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## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ufug.2022.127736.

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